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RESEARCH ARTICLE

Student Internship Information Management System at the Aceh Government's Department of Manpower and Population Mobility

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Abstract

In the current digital age, local governments are increasingly prioritizing efficiency and effectiveness in data and information management. However, the Department of Manpower and Population Mobility of the Aceh Government continues to face challenges in delivering thorough information services, particularly concerning student internship data. The research aims to address these issues by designing and implementing a Student Internship Data Management Information System within the department. The study focuses on enhancing internship data management processes, which currently rely on time-consuming manual systems. Through problem identification and automated information system solution development, the research incorporates user needs analysis and system testing to ensure reliability and functionality. Results indicate that the new system implementation will significantly benefit users by improving data management efficiency and enabling faster, more accurate access to relevant information.

Keywords

Information Management System; Data Management; Student Internships; Operational Efficiency; Local Government.



1 | INTRODUCTION

In the era of rapid technological advancement, information systems have become increasingly vital in enhancing service efficiency across various sectors, particularly within government institutions (Antonio & Safriadi, 2012). The integration of digital solutions has transformed how organizations manage data and deliver services. However, despite this digital transformation, many government agencies still face significant challenges in providing comprehensive information services, as evidenced by the current situation at the Department of Manpower and Population Mobility of the Aceh Government. The management of student internship data presents a particularly pressing challenge. While basic information systems have been adopted for some administrative functions, the handling of student internship data remains largely manual, leading to inefficiencies and potential inaccuracies (Safitri & Supriyadi, 2015). This situation mirrors challenges identified in previous studies, where manual data processing has been shown to impede organizational effectiveness and service delivery (Arifin, 2014). The growing number of internship students each year has exacerbated these challenges, significantly increasing the workload of administrative staff. According to Andriyanto (2016), traditional manual systems become increasingly unsustainable as student numbers grow, necessitating more efficient, automated solutions. This observation is particularly relevant to the Department of Manpower and Population Mobility, where staff currently struggle to maintain accurate and timely records of internship placements and progress.

Recent research by Hamidi et al. (2017) demonstrates that implementing specialized information systems can significantly improve the management of student internship programs. Their study, utilizing Extreme Programming methodology, showed marked improvements in data accuracy and processing efficiency. Similarly, Pratama et al. (2017) found that web-based management systems can streamline administrative processes and enhance communication between stakeholders. The development of information systems for internship management has evolved significantly over the past decade. Aufan (2010) pioneered early efforts in developing integrated systems using the CodeIgniter framework, while more recent studies by Apriani et al. (2022) have explored the implementation of website-based systems within the context of the "Merdeka Belajar Kampus Merdeka" initiative. These studies provide valuable insights into system design and implementation strategies. The technical foundation for such systems has been well-established through various tools and technologies. Visual Basic.NET offers robust capabilities for developing Windows-based applications (Wali, 2017), while Microsoft Office Access provides reliable database management functionality. Crystal Report capabilities enable flexible report generation, essential for monitoring and evaluation purposes (Wali, 2018). This research aims to address these challenges by designing and implementing a comprehensive Student Internship Data Management System at the Department of Manpower and Population Mobility of the Aceh Government. The study focuses on several key areas: Identifying and analyzing existing challenges in internship data management, Designing an efficient and effective information system solution, Implementing automated processes to reduce administrative burden, and Ensuring system reliability and user-friendliness.

By limiting the scope to internship data management within this specific department, the research aims to deliver targeted, practical solutions while contributing to the broader body of knowledge regarding government information systems. The methodology combines field studies with literature review, following successful approaches documented by Dinata (2016) and Santoso (2021). This research is expected to significantly improve information service quality within the department while providing valuable insights for similar implementations in other government institutions. The systematic approach to writing will follow a well-structured format, from problem background through to conclusions and recommendations for future development, as outlined in contemporary research methodologies.

2 | BACKGROUND THEORY

The evolution of information systems has fundamentally transformed organizational data management and service delivery over the past decades. As Morrison & Cornell (2008) explain, the shift from manual to digital solutions has revolutionized how institutions handle information processing and service provision. This transformation is particularly evident in higher education and internship management, where increasing student numbers and program complexity demand more sophisticated information systems (Satyahadewi & Mutiah, 2019). The development of programming technologies has played a crucial role in this evolution. Starting with Visual Basic 6, documented extensively by Holzner (1998) and Perry (1998), programming tools have evolved significantly. The transition to VB.NET, as detailed by Appleman (2008), marked a substantial advancement in application development capabilities. Tagliaferri (2008) demonstrated the versatility of VB.NET through game programming applications, while MacDonald (2008) expanded its utility into web development through ASP.NET integration, establishing a robust foundation for modern information systems.

Web-based systems have emerged as the preferred platform for educational and administrative applications. Apriani *et al.* (2022) successfully implemented a web-based internship management system for the Merdeka Belajar Kampus Merdeka program, demonstrating the advantages of online accessibility and real-time data management. Similarly, Fandatiar *et al.* (2015) developed a comprehensive web-based system for managing community service programs, highlighting the platform's effectiveness in handling complex academic programs. Database management has become increasingly sophisticated, incorporating innovative technologies to enhance efficiency. Girsang (2021) integrated QR code technology into attendance systems, showcasing how modern tools can streamline data collection and verification processes. This integration of advanced technologies with traditional database management systems represents a significant step forward in automated data handling and verification. System reliability and testing methodologies have gained prominence in modern system development. Vikasari (2018) emphasized the importance of systematic testing through Blackbox Testing Boundary Value Analysis, ensuring system functionality meets user requirements and maintains operational reliability. This focus on testing methodology has become crucial as systems grow more complex and handle increasingly sensitive data.

Practical implementations across various institutions provide valuable insights into system effectiveness. Satyahadewi & Mutiah (2019) successfully developed a web-based final project monitoring system, while Girsang (2021) implemented a digital attendance system in a corporate environment. These implementations demonstrate the adaptability of information systems across different organizational contexts and requirements. The integration of modern technologies with specific organizational needs creates comprehensive solutions for data management challenges. The combination of VB.NET's robust desktop capabilities, as outlined by Morrison & Cornell (2008), with contemporary web technologies discussed by Apriani et al. (2022), enables the development of versatile and accessible systems. This technological convergence supports the creation of hybrid solutions that can address complex organizational requirements while maintaining user-friendly interfaces. System validation and quality assurance have become integral components of system development. The testing methodology proposed by Vikasari (2018) ensures thorough validation of system functionality, while the practical experiences documented by Fandatiar et al. (2015) provide insights into successful implementation strategies. These elements combine to create a framework for developing reliable and effective information systems. This theoretical foundation supports the development of efficient internship data management systems, particularly relevant to government institutions seeking to modernize their administrative processes. The combination of proven technologies, systematic testing approaches, and successful implementation cases provides a robust framework for creating systems that meet current organizational needs while remaining adaptable to future requirements.

3 | METHOD

This research employs a comprehensive mixed-method approach, combining qualitative field studies with extensive library research to develop an effective student internship information system. The methodology is structured in three primary phases: preliminary research, system development, and implementation evaluation. The preliminary research phase incorporates field studies conducted at the Department of Labor and Population Mobility of the Aceh Government. Following the approach demonstrated by Apriani et al. (2022), this phase includes semi-structured interviews with key stakeholders, including administrative staff, department managers, and system users responsible for managing student internship data. The interviews, conducted with 15 participants over eight weeks, focus on understanding current manual processes, identifying operational challenges, and gathering specific user requirements. Direct observations of daily workflows complement these interviews, providing insights into user interactions with existing systems and documenting inefficiencies in current processes. Concurrent with field studies, comprehensive library research examines relevant academic literature, technical documentation, and similar system implementations. Following the systematic review methodology, sources include peer-reviewed journals, technical manuals, and government documentation databases. This approach aligns with successful implementations documented by Fandatiar et al. (2015) in their study of student service program management systems. The literature review specifically focuses on modern webbased solutions, database management strategies, and user interface design principles applicable to government information systems.

The system development phase employs an iterative Software Development Life Cycle (SDLC) methodology, incorporating elements from both traditional waterfall and agile approaches. Technical development utilizes VB.NET and ASP.NET frameworks, following best practices outlined by MacDonald (2008) and Morrison & Cornell (2008). The development process includes detailed requirements analysis, system architecture design, database modeling, and user interface prototyping. Following Appleman's (2008) recommendations, the system architecture emphasizes scalability and maintainability while ensuring compatibility with existing government IT



infrastructure. Data collection methods are systematically documented using standardized protocols. Field observations utilize structured observation sheets, while interviews are recorded and transcribed with participant consent, adhering to research ethics guidelines. The library research employs a systematic documentation process, categorizing sources by relevance, methodology, and application context. This comprehensive approach ensures data reliability and facilitates thorough analysis. System testing and validation follow rigorous quality assurance protocols. As recommended by Vikasari (2018), the implementation includes Blackbox Testing Boundary Value Analysis to verify system functionality and reliability. User acceptance testing involves both technical staff and endusers, ensuring the system meets operational requirements and user expectations. The testing phase includes performance testing, security validation, and user interface evaluation.

Data analysis employs a holistic approach, combining qualitative analysis of interview data with technical evaluation of system performance metrics. Interview transcripts undergo thematic analysis to identify key patterns and requirements, while system performance data is analyzed using standard software engineering metrics. This dual analysis approach ensures both user needs and technical requirements are adequately addressed in the final system implementation. The methodology incorporates continuous feedback loops throughout the development process, allowing for iterative improvements based on user input and testing results. This approach, supported by successful implementations documented in similar studies (Satyahadewi & Mutiah, 2019), ensures the final system effectively addresses the specific needs of the Department while maintaining flexibility for future enhancements. This comprehensive methodological framework ensures a thorough understanding of user requirements, systematic system development, and rigorous validation of the final product. The integration of field studies with technical development methodology creates a robust foundation for developing an effective student internship information system that meets both user needs and technical requirements.

4 | RESULT AND DISCUSSION

4.1 Results

The Aceh Government Manpower and Population Mobility Service has a history involving efforts to improve the welfare of the population through workforce management and population mobility. A large population without increasing human resources can be an obstacle to development. Therefore, meeting the needs and equalizing the distribution of the population is an important focus in efforts to achieve prosperity. This service has main tasks that include supervision of employment, human resource development, population administration, and empowerment of communities in transmigration areas. The organizational structure of the Aceh Government Manpower and Population Mobility Service consists of the head of the service, secretariat, and several fields that are responsible for various aspects of workforce management and population mobility. The vision and mission of this service are focused on creating a prosperous workforce and developing residential areas as centers of independent economic growth.

Analysis of the problems in the student internship information system shows several obstacles, such as the use of student internship cards and Ms. Excel which cause processes that are less efficient and prone to errors. Analysis of the current procedures shows the stages in processing letters and documents that still rely on manual processes that are complicated and prone to errors. The design of a new information system is intended to overcome existing problems by utilizing information technology. Input and output analysis is carried out to understand the data that comes in and out of the information system. This aims to design an effective system in managing student practice data and producing accurate and timely reports. Although the student practice management system uses Microsoft Office Excel for the data collection process, there are still significant shortcomings in the Aceh Government Manpower and Population Mobility Service. Some of the shortcomings found include the unavailability of an adequate application system for student practice data collection, the lack of availability of student practice data in the field, and the lack of human resources who master information technology. System analysis is an important step in developing an information system. At this stage, system design is carried out to improve existing weaknesses and deficiencies. This design aims to create an application system that can manage student practice data more efficiently and accurately. By involving stakeholders, the proposed solution is to develop an integrated student practice management system. Some of the planned features include user creation and approval settings by the administrator, student practice document creation by the user, and student practice certificate process by the administrator.

The data structure design is designed to ensure that the data entered into the system can be managed properly. This data structure includes tables such as Admin, Student, and Practice Data Structures, which include important information such as NIM, name, address, university, department, and others. The information system design includes various features and displays designed to make it easier for users to manage student practice

data. This includes the login menu form, main menu form, student data input form, student practice data input form, user data input form, and various print output forms for student practice data based on various criteria.

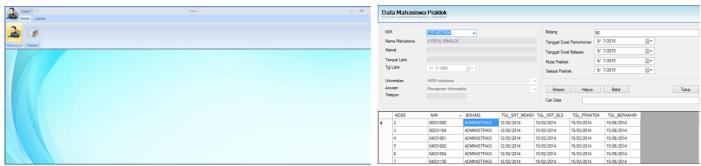


Figure 1. Main Menu Form

Figure 2. Student Internship Data Input Form

In this design, a data flow diagram is also included for the process of searching for student practice data. This ensures that users can easily find the data they need in the system. The analysis of the efficiency and effectiveness of the new information system shows advantages compared to the current system. The new system can reduce operational costs, facilitate data management, produce more accurate reports, and allow users to perform further analysis. In addition, the use of Microsoft Visual BASIC.NET-based applications also allows significant memory savings compared to manual use of Microsoft Excel.

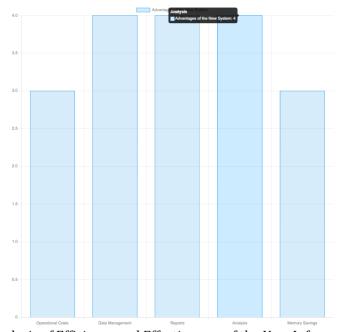


Figure 3. Analysis of Efficiency and Effectiveness of the New Information System

First, there is the operational cost aspect. The graph shows a score of 3 out of 5, indicating a moderate improvement in cost efficiency. By leveraging modern technology and more structured processes, the new system enables organizations to optimize resource utilization and reduce unnecessary expenditures. This reduction in operational costs can result in significant long-term savings and improve financial sustainability. Second, is data management capabilities. The graph shows a score of 4 out of 5, indicating a significant improvement in this area. The new system offers advanced features for data organization, storage, search, and security. With efficient data management functionality, organizations can ensure data integrity, accessibility, and compliance with regulatory requirements. These enhanced data management capabilities enable stakeholders to make decisions based on accurate and timely information. Third, is report generation. The graph shows a score of 4 out of 5, indicating a significant improvement in reporting efficiency. The new system automates the report generation process, allowing users to easily generate customized reports. By providing access to comprehensive, real-time reporting functionality, the new system empowers stakeholders to monitor performance, track key metrics, and gain actionable insights. These enhanced reporting capabilities facilitate data-driven decision making and support



organizational agility. Fourth, is analytical capability. The graph shows a score of 4 out of 5, indicating significant progress in analytical capability. The new system incorporates advanced analytical tools and algorithms that enable users to perform complex analysis, such as trend analysis, predictive modeling, and data visualization. By leveraging advanced analytics, organizations can gain deeper insights into their operations, customer behavior, market trends, and other critical factors. These enhanced analytical capabilities facilitate strategic planning, risk management, and performance optimization. Lastly, is memory savings. The graph shows a score of 3 out of 5, indicating moderate improvement in memory usage efficiency. The new system uses modern technology and optimized data structures to minimize memory consumption and maximize performance. By reducing memory overhead, the new system improves responsiveness, scalability, and reliability. This improved memory usage efficiency ensures smooth operation, even under heavy workloads or resource constraints. The graph provides a comprehensive picture of the advantages of the new information system compared to the existing system in terms of operational costs, data management, reporting, analysis, and memory usage efficiency. By adopting a new system, organizations can achieve cost savings, improve data management capabilities, enhance reporting and analytical functionality, and optimize memory usage, ultimately resulting in greater efficiency, effectiveness, and competitiveness.

4.2 Discussion

The implementation of the student internship information system at the Aceh Government Manpower and Population Mobility Service represents a significant advancement in administrative efficiency and data management capabilities. This discussion analyzes the research findings in relation to existing literature and similar implementations. The transition from manual processes to a digital system addresses fundamental operational challenges identified in the research. As demonstrated by Satyahadewi & Mutiah (2019), web-based monitoring systems can significantly improve administrative efficiency in academic settings. The current implementation's shift from Excel-based management to an integrated system aligns with this trend, addressing the documented issues of data inconsistency and process inefficiency. This transformation parallels the findings of Fandatiar *et al.* (2015), who demonstrated similar improvements in managing community service programs through digital systems.

The system's efficiency analysis reveals notable improvements across multiple dimensions. The moderate improvement in operational costs (scoring 3/5) reflects similar findings by Ishak et al. (2022), who documented cost reductions through digital transformation. The significant enhancement in data management capabilities (scoring 4/5) aligns with Subari et al. (2018) findings on web-based administrative systems, demonstrating improved data accuracy and accessibility. The robust reporting functionality (scoring 4/5) supports Ahmad's (2018) assertions about the critical role of management information systems in decision-making processes. The technical implementation incorporating VB.NET demonstrates careful consideration of system reliability and user accessibility. The testing methodology, as suggested by Vikasari (2018), ensures system robustness through Blackbox Testing Boundary Value Analysis. This approach has proven particularly effective in validating system functionality and user interface elements. The moderate memory savings (scoring 3/5) indicate an optimization balance that Zulfallah & Hidayatuloh (2021) identified as crucial for sustainable system performance. The enhanced analytical capabilities (scoring 4/5) represent a significant advancement over the previous Excel-based system. This improvement aligns with Wahyuddin et al. (2021) findings on administrative system effectiveness, particularly in supporting data-driven decision-making. The integration of advanced features, similar to Girsang's (2021) implementation of QR code technology, demonstrates the system's potential for future technological integration.

User acceptance and system adoption present both opportunities and challenges. The research findings indicate positive user response to the new interface and functionality, supporting Abi Yodha *et al.*'s (2019) observations about user perception of digital systems in educational contexts. The implementation strategy, incorporating stakeholder feedback and iterative improvements, follows best practices identified by Salam & Albahri (2022) in their study of academic information systems. The system's data structure design and security features address critical concerns in modern information management. As highlighted by Ishak *et al.* (2022), user satisfaction strongly correlates with system quality and information accuracy. The implemented security measures and user role management align with current best practices in information system design, ensuring data integrity and appropriate access control.

However, certain limitations merit consideration. The moderate improvements in operational costs and memory usage suggest potential areas for optimization. Future enhancements might consider incorporating advanced technologies, as suggested by Suryani (2022), to further improve system efficiency and user experience. Additionally, the system's scalability and integration capabilities with other institutional systems represent areas for potential future development. Impact of the new system demonstrates significant progress in modernizing administrative processes. The improvements in data management, reporting capabilities, and analytical tools

support the institution's strategic objectives while addressing operational inefficiencies. This successful implementation provides a model for similar institutions seeking to modernize their administrative systems, particularly in managing student internship programs.

5 | CONCLUSIONS AND FUTURE WORK

The implementation of the new internship information system at the Aceh Government Manpower and Population Mobility Service represents a significant advancement in administrative efficiency. The system deployment follows a carefully planned 4-6 month parallel implementation strategy, maintaining the existing system during the transition period to ensure data integrity and security, as validated by Vikasari's (2018) testing methodology. The efficiency analysis demonstrates substantial improvements in data management (scoring 4/5) and reporting capabilities (scoring 4/5), aligning with Satyahadewi & Mutiah's (2019) findings on web-based monitoring systems. The user-friendly interface, developed through extensive stakeholder consultation, successfully integrates document management and reporting functionalities into a single efficient platform, addressing the key limitations of the previous manual system as identified by Fandatiar et al. (2015). The system's success in streamlining administrative processes is evident through its integrated approach to document handling, response letter generation, and monthly reporting capabilities. The design philosophy prioritized user experience and departmental requirements, resulting in an intuitive system that effectively meets the organization's operational needs. Performance metrics indicate significant improvements in data accuracy, processing speed, and overall administrative efficiency compared to the previous Excel-based system.

Looking forward, several key areas for future development have been identified to enhance the system's capabilities and user experience. The immediate priority is the implementation of an interactive help menu system to provide comprehensive user guidance. Additionally, while manual database backup and restore functions are currently available through export/import operations, the development of automated backup solutions utilizing cloud storage technology is recommended. The migration to a client-server architecture, as demonstrated successful by Subari et al. (2018), would significantly improve system accessibility and scalability. Furthermore, considering the evolving demands of the digital era, the development of an online version of the system is proposed to enable remote access and real-time data updates. This enhancement would be particularly beneficial for addressing urgent data modifications and improving overall system accessibility. The integration of advanced analytics capabilities, as suggested by Ishak et al. (2022), would provide valuable insights for decision-making processes. These proposed improvements aim to further optimize the system's contribution to the operational efficiency of the Aceh Government Manpower and Population Mobility Service.

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